

**WHAT IS CLAIMED IS:**

1. A method for identifying functional elements in a DNA sequence, the method comprising the steps of:

(a) calculating at least one set of dyad pair type frequencies within a portion of the DNA sequence equal in size to two times a window size, around at least one potential axis of dyad symmetry in the DNA sequence, and

(b) based on said at least one set of dyad pair type frequencies, identifying regions of the DNA sequence containing the functional elements.

2. The method of claim 1, wherein at least one of said at least one set of dyad pair type frequencies is an ordered array of said dyad pair frequencies.

3. The method of claim 1, wherein said calculating is effected iteratively for each said at least one potential axis of dyad symmetry in the DNA sequence.

4. The method of claim 1, wherein said step of identifying regions of the DNA sequence containing the functional elements is effected by steps including subjecting said at least one set of dyad pair type frequencies to statistical analysis, whereby at least one region in the DNA sequence is identified that possesses at least one statistical value that indicates that an observed said at least one set of dyad pair type frequencies deviates from an expected said at least one set of dyad pair type frequencies.

5. The method of claim 4, where said at least one statistical value is chosen from the group consisting of residuals of said dyad pair type frequencies, chi-square values, and likelihood ratios.

6. The method of claim 4, wherein said statistical analysis includes plotting said statistical values.

7. The method of claim 1, wherein said window size is an independent variable, having a value of at least 1 and at most one half a length of the DNA sequence.

8. The method of claim 1, wherein said calculating of said at least one set of dyad pair type frequencies is performed on at least one dyad pair wherein both nucleotides of said at least one dyad pair are located on a single strand of the DNA sequence.

9. The method of claim 1, wherein said calculating of said at least one set of dyad pair frequencies is performed on at least one dyad pair wherein both nucleotides of said at least one dyad pair are located on complementary strands of the DNA sequence.

10. A method of identifying transcription related functional elements, comprising the method of claim 1.

11. A system for identifying functional elements in a DNA sequence, the system comprising:

(a) a software module including a plurality of instructions for calculating at least one set of dyad pair type frequencies within a portion of

the DNA sequence equal in size to two times a window size, around at least one potential axis of dyad symmetry in the DNA sequence,

- (b) a memory for storing said instructions, and,
- (c) a processor for executing said instructions.

12. A computer readable storage medium having computer readable code embodied on said computer readable storage medium, the computer readable code for identifying functional elements in a DNA sequence, the computer readable code comprising: program code including a plurality of instructions for calculating at least one set of dyad pair type frequencies within a portion of the DNA sequence equal in size to two times a window size, around at least one potential axis of dyad symmetry in the DNA sequence

13. A method for determining electrical conductivity properties of a DNA sequence, the method comprising the steps of:

- (a) calculating at least one set of dyad pair type frequencies within a portion of the DNA sequence equal in size to two times a window size,

around at least one potential axis of dyad symmetry in the DNA sequence,

and,

(b) based on said at least one set of dyad pair type frequencies, determining the electrical conductivity properties of the DNA sequence.

14. A system for determining electrical conductivity properties of a defined DNA sequence, the system comprising:

(a) a software module including a plurality of instructions for calculating at least one set of dyad pair type frequencies within a portion of the DNA sequence equal in size to two times a window size, around at least one potential axis of dyad symmetry in the DNA sequence,

(b) a memory for storing said instructions, and,

(c) a processor for executing said instructions.

15. A computer readable storage medium having computer readable code embodied on said computer readable storage medium, the computer readable code for determining electrical conductivity properties of a defined DNA sequence, the computer readable code comprising: program code including a

plurality of instructions for calculating at least one set of dyad pair type frequencies within a portion of the DNA sequence equal in size to two times a window size, around at least one potential axis of dyad symmetry in the DNA sequence.